# Chapter 5. Summary of Conceptual Approaches

The project team developed four conceptual approaches to improving the transportation conditions in the Marin Headlands and Fort Baker. These approaches are the product of a weeklong team "charette" in December 2000, public input gathered at a community workshop in March 2001, and ongoing revisions by the Park Service and the project team.

(See Appendix B for a summary of the participants and comments associated with conceptual approach development.)

Each approach reflects a clear emphasis that is not mutually exclusive with any of the other alternatives. "Fatal flaws" have been eliminated from all the approaches to maximize the feasibility of successful implementation. None of them have been designated as a preferred alternative. As will be discussed in Chapter 7, implementation of the Transportation Management Study will draw upon the best program elements in each of the four approaches. Depending on their level of administrative complexity and funding requirements, the program elements can be appropriately sequenced as part of an overall phasing strategy.

The summaries below generally describe the programmatic goals of each approach with an emphasis on the way they would address key concepts like wayfinding or transit improvements or parking. The specific program elements are illustrated in maps to show the precise locations where each element will be implemented. Detailed information about the implementation challenges, coordination issues, and design specifications are summarized in tables prepared for each alternative.

These tables also include the estimated annual and operating costs, for each program element. These estimates were calculated from unit costs provided by Fehr & Peers Associates and URS/BRW. Although the project team reviewed the National Park Service's own handbook for unit capital costs, most program elements required reference to other unit cost handbooks and comparisons with other similar projects. Major capital projects are given very rough cost estimates but require significantly more planning to derive more accurate estimates.

Whenever possible, annual maintenance costs are also provided. However, it should be noted that many projects will require additional planning or design before an accurate maintenance cost can be made. It should also be noted that certain maintenance costs like landscaping, asphalt repaving, or security are ongoing Park costs that would not be significantly changed by the Transportation Management Study. A full itemization of maintenance costs including the estimated lifespan of capital improvements is provided in Appendix C.

Certain projects such as parking removal may enable other non-transportation related improvements such as ecologic restoration of native habitat areas. These types of costs are not included in the matrices, as they could only be determined through an environmental analysis of the affected landscape. Concepts that were explored but determined to be fatally flawed are described in Appendix D.

# Approach 1: Simple Improvements

The Simple Improvements approach assumes no change in the study area's existing means of access, circulation network, or levels of transit service. Implementation of the plan would not require significant capital investments, coordination between multiple agencies or ongoing funding sources. Instead, the Simple Improvements approach proposes easy-to-implement and low-cost solutions to the most basic transportation problems identified within Park boundaries. Many of these improvements could be implemented in tandem with the concepts described in the other approaches. Many could also be implemented without environmental review.

## Wayfinding

The Park's geography would be organized into three spatial categories: Regional Destinations, Visitation Areas, and Park Places. Each category would be treated with a separate signage program appropriately sized and situated for its particular geographic scale in the study area.

Regional Destination signs would be placed on US 101 and Alexander Avenue, indicating the access points for Fort Baker and the Headlands. Signs for the Marin Headlands and Fort Baker would be placed on southbound and northbound US 101 in advance of the Alexander Avenue exit ramps. Signage would be placed at the intersection of the northbound US 101 off-ramp and Alexander Avenue to indicate the eastbound direction of Fort Baker on Alexander Avenue. New signage on eastbound Alexander Avenue before East Road would indicate the accessibility of Fort Baker via East Road. A sign on westbound Alexander Avenue just before Danes Drive would indicate the direction of the Headlands and Fort Baker via Danes Drive.

Visitation Area signs would identify the distance and direction of larger areas where Park attractions are clustered within walking distance of each other. These areas include Battery Spencer, Hawk Hill, Point Bonita, Fort Barry, Visitors Center, and Fort Cronkhite/Rodeo Beach. In Fort Baker, they include the Parade Grounds and the waterfront. Signs would be placed on all sides of the major intersections in the Headlands including the Conzelman Road/US 101 southbound on ramp; Conzelman/McCullough Road; Conzelman/Field (near the Bicentennial parking lot); Conzelman/Field (at the YMCA); Field/Visitors Center; Field/Bunker; Bunker/McCullough Road. In Fort Baker, signs would be placed at East/Center, Murray Circle/Center, and Bunker/McReynolds.

Park Place signs would identify the distance and direction of specific attractions (like the Point Bonita Lighthouse or the Marine Mammal Center) within each of the seven Visitation Areas. Park Place signs would be installed at key places on the Park's road network: Conzelman Road at the Battery Spencer parking pullout; Field Road at the YMCA; Field Road at the Visitors Center; Bunker Road/Mitchell Road intersection; and Center Road in Fort Baker.

Besides the directional signage program, another wayfinding aid would be information kiosks installed in visitor destination areas. These kiosks would feature accurate maps of the Park and the surrounding area, transit information, as well as interpretive information about the study area's historic road network. They would be located at the Visitors Center and at each of the Park Places.

New street signage would be installed at key intersections throughout the Park. Standardized nomenclature would be used for street names such as Alexander Avenue (also referred to as Alexander Road or the Sausalito Lateral) or East Road (sometimes called Fort Baker Road).

## Transit Information Improvements

Any approaches to improving the Park's transportation system should include improvements to the dissemination of transit information. A public transit information campaign would include printed brochures and Web pages describing transit services to the Park. Maps, schedules, as well as information about bike connections and pedestrian trails would be presented in multiple languages and in graphic form. Published brochures would be distributed inside the Park locations and in a cross-range of Bay Area communities served by transit.

Improved bus stop signs would be installed at the points inside and outside the Park that are served by the Muni 76 and Golden Gate Transit routes. A bus stop sign would also be placed at the Bay Area Discovery Museum, which at times is served by the SALLY Shuttle. All the signs would be on posts and visually identifiable from a physical distance.

Coordinated efforts would be made among the Park Service, Muni, and Golden Gate Bridge and Highway District to include clear public transit directions for getting to the Park. The level of effort should be consistent with the availability of transportation services. (Since the transportation changes are so dramatic in Approach 4, a specific program element for transit information is identified for that approach. However, it can be assumed that transit information, like other program elements in Approach 1 can be relevant to the other approaches as well.)

## Bike and Pedestrian Improvements

A westbound uphill bike lane would be striped on Conzelman Road for a few hundred feet before and after Battery Spencer. To accommodate the bike lane around the curve at Battery Spencer, a short segment of Conzelman's roadway would be widened by less than two feet. Modifications to Conzelman Road (or any roadway in the Park) would comply with the Park Service's cultural resource preservation guidelines.

Traffic calming devices would be installed in the Headlands to minimize potential conflicts between vehicles, bicyclists, and pedestrians. Speed humps would be installed along the

flat straight away sections of Bunker Road in the Headlands beyond the Capehart housing area. A raised pedestrian crosswalk would be installed at the intersection of Bunker and Field Roads.

Secure bike parking facilities would be provided at seven Visitation Areas in the Park including Battery Spencer, Hawk Hill, Point Bonita, Fort Barry, Visitors Center, and Fort Cronkhite/Rodeo Beach. The parking amenity would consist of solidly designed racks with square bars, bolted into concrete. The racks would provide parking for a minimum of ten bicycles in each of the Visitation Areas.

Bicycle safety signs and "share the road" pavement stencils would be installed at Park entrances and along key road segments to alert drivers of the mixture of travelers sharing the roadways. In the Headlands, the signs and stencils would be installed on Conzelman, McCullough and Bunker Roads. In and around Fort Baker, the signs and stencils would be installed on Alexander Avenue, Bunker, and East Road.

### Parking Management

At popular Park Places such as Battery Spencer or Point Bonita, signage would be installed to indicate the availability of additional parking spaces at places such as the trailhead lot or Battery Alexander. At Battery Spencer, the existing unpaved parking area would be paved and striped to facilitate movement in and out of the Conzelman roadway and to help minimize vehicular conflicts with pedestrians.

## Approach 2: Circulation Enhancements

The Circulation Enhancements approach would create a safer, more efficient environment for all travel modes through modifications to the circulation network, bike and pedestrian improvements, and parking demand management. This approach assumes the mode split will remain as it is today, with the majority of visitors coming via private automobile, followed by bicycle, transit and walking.

### Vehicular Circulation

The road circulation system in the Headlands would be modified into a one-way loop with a sole entrance at Conzelman Road and a sole exit at the Barry-Baker Tunnel. Only inbound (westbound) traffic would be allowed on the segment of Conzelman Road east of McCullough Road. Only outbound (eastbound) traffic would be allowed on the segment of Bunker Road east of McCullough Road. Eliminating a complete direction of traffic flow on both Conzelman Road and Bunker would enable the restriping of the road segments with bi-directional Class II bike lanes. McCullough Road could also be re-striped to accommodate one-way vehicular flows and bi-directional bike lanes. However, the maintenance of two-way vehicular traffic on McCullough Road would also enable visitors

at Fort Cronkhite to access Hawk Hill without leaving the Park. It should be noted that along most of McCullough Road, there is sufficient roadway to maintain two traffic lanes and an uphill bike lane.

With the one-way circulation concept, all Headlands traffic would exit the Park by traveling east on Bunker through the Barry-Baker Tunnel and continuing on Danes Drive toward Alexander Avenue. Two-directional flow on Danes Drive would be maintained to enable access to Fort Baker via eastbound Bunker. The greater number of turning movements from Danes Drive on to Alexander Avenue may require geometric improvements on Danes. Specifically, a separate right-turn lane for vehicles turning off of Danes Drive onto Alexander Avenue towards US 101 may be necessary.

The one-way circulation plan would also enable changes at the Conzelman Road/Alexander Avenue/US 101 southbound on-ramp intersection. With the restriction of Conzelman Road as an entrance only, there would no longer be a need for access from Conzelman Road in the Headlands to eastbound Alexander Avenue. Consequently, a segment of Alexander Avenue's eastbound traffic lanes could be eliminated and re-striped with a second lane for southbound traffic. One lane would be for accelerating vehicles headed to US 101 and the other lane would be for right-turning vehicles headed for Conzelman Road. In addition, vehicles exiting southbound US 101 and then heading east would no longer have to stop. A traffic impacts analysis would be required to confirm the operability of this concept.

The one-way circulation program would eliminate the need for traffic controls on either side of the Barry-Baker Tunnel. However, some control device could still be provisionally maintained for the benefit of emergency vehicle access and to avoid air quality issues that might result from a queue through the tunnel.

Many visitors to the Headlands currently enter the Park via Conzelman Road, stop briefly at Battery Spencer, and then return directly to the highway. Under this alternative, all of these cars would be required to use McCullough Road and Bunker to exit the Park. (However, visitors could also avoid entering the Headlands, park at the Trailhead lot and then walk to Battery Spencer along Conzelman Road.) Prior to implementation, traffic analyses would be conducted to assess the impacts of the one-way circulation on the Park's and the surrounding area's traffic flows and intersection performance.

Besides the one-way circulation concept, there are other circulation improvements which would improve the overall operation of the road network. The Bunker/McCullough and Bunker/Field intersections in the Headlands could be modified into "T" intersections to improve sightlines, reduce the travel speeds of turning vehicles and reduce conflicts between auto traffic and pedestrian crossings.

The intersection of Alexander Avenue with the US 101 northbound ramps could be modified into a modern roundabout. This intersection currently provides Alexander

Avenue traffic with the right-of-way in the westbound direction and US 101 traffic the right-of-way in the eastbound direction. Vehicles exiting off of US 101 and proceeding westbound through the Alexander Avenue underpass currently yield to westbound Alexander Avenue traffic. This condition makes it difficult to complete the left-turn maneuver under peak conditions. With implementation of the one-way circulation plan, all traffic into the Headlands would use the Conzelman Road entrance, requiring even more vehicles to complete this maneuver. Installation of a modern roundabout at this intersection would prioritize the left turn movement. A feasibility study, a Project Study Report, and an environmental analysis/compliance document would be required to make this type of modification.

Like all the proposed alternatives in the Transportation Management Study, Approach 2 assumes implementation of other traffic improvements currently in the planning stages. This includes the redesign of the Alexander Avenue underpass beneath US 101 as well as the intersection improvements to Alexander and Danes. However, it is important to note that Approach 2 would not require the Danes/Bunker intersection improvement proposed in the Fort Baker EIS. Since no inbound Park traffic would be entering the Barry-Baker Tunnel, a dedicated right turn lane on westbound Danes Drive would no longer be needed for access to Bunker Road.

## Bike and Pedestrian Improvements

The one-way circulation plan would enable a reallocation of road space on Conzelman Road and Bunker Road in the Headlands to bike lanes without altering the historic roadbed. Bi-directional Class II bike lanes would be striped on the segments of these roads that are east of McCullough Road. (Another option on Conzelman Road would be to build an ocean-side mixed-use trail facility.) Bike lanes would not be striped on McCullough Road which would continue to accommodate two-way traffic.

To accommodate east-west bike flows through the Headlands, two options could be evaluated:

(1) The Rodeo Valley Trail could be resurfaced with "Road Oyl," a pine resin product which enables bikes to travel smoothly. This type of surface treatment was used on the Crissy Field Promenade. A bridge would be constructed across the creek near the Capehart housing area so that bicyclists could proceed continuously from the bike lanes east of McCullough Road to the Rodeo Valley Trail as they traveled west of McCullough Road.

(2) A more capital intensive approach (and with cultural resource impacts) would be to widen Bunker Road west of McCullough Road and continue the bi-directional bike lanes on Bunker all the way to Fort Cronkhite.

Trail connections would be improved between Point Bonita, the Hostel area and Fort Cronkhite. New trails would be designed to minimize impacts on the sensitive environmental landscape between these destinations. Prior to design and implementation, an environmental assessment would be made of the affected areas.

Consistent with the Marin County and Sausalito Bike Plans, Alexander Avenue between the US 101 northbound off ramp and East Road would be re-striped with bi-directional Class II bike lanes. In order to run the bike lanes continuously along this road segment, additional study may be necessary of the road's choke points, particularly along its bridge/causeway sections.

The Conzelman/McCullough Road intersection would be redesigned to improve pedestrian access to the Coastal Trail and enhance bicycle circulation. Currently, two islands separate

traffic on McCullough Road. The west most island makes trail access difficult for bicyclists coming from most directions. Cutting a path through the island would provide safer access to the trail while maintaining a refuge for pedestrians and cyclists waiting to cross the street. New crosswalks would channel cyclists and pedestrians to the cutout. The small parking area at the Coastal trailhead northwest of the intersection would be eliminated.

The Golden Gate Bridge pedestrian underpass at the bridge's northern terminus would be redesigned. The underpass currently provides the only way for pedestrians to cross from the east side of US 101 to the Headlands. The steep stairways on either side of the underpass would be reconstructed to better accommodate bicyclists and disabled individuals. Given the environmentally sensitive area surrounding the underpass, the project would require a comprehensive site analysis, and environmental assessment.

As a way of facilitating pedestrian access to Fort Baker, new signage would be installed at Vista Point to indicate the connectivity of the fire road trail around Vista Point with Lower Conzelman Road and Horseshoe Bay.

Like all the alternatives, Approach 2 assumes implementation of other bike and pedestrian improvements currently being addressed in other planning processes. These improvements include the continuation of the Bay Trail along East Road to Alexander Avenue and bike access through the Alexander Avenue underpass beneath US 101.

### Parking Management

Parking fees would be collected at high parking demand locations including Battery Spencer, Fort Cronkhite, Point Bonita and the BADM. Parking fees would encourage redistribution of parking demand to nearby parking areas such as Battery Alexander or the trailhead lot or along East Road. Fees would be collected through the installation of automated hourly permit dispensers. Although the dispensers would preclude the need for labor to collect fees, ongoing staff would be needed to manage the dispenser and enforce compliance.

## Approach 3: Parking Consolidation and Shuttle Service

The Parking Consolidation and Shuttle Service approach would provide more options for accessing the Park without an automobile while reducing the impact of the vehicle on the visitor experience. Two shuttle services would connect the Golden Gate Bridge Toll Plaza with the Marin Headlands and Fort Baker on weekends. The shuttles would offer an optional way for moving within the Park and enhance connections to local and regional transit services including the Sausalito Ferry Terminal. Consolidation of parking areas in the Headlands and Fort Baker would enable the establishment of certain car-free zones as well as ecologic restoration to native habitat areas. Parking fees would discourage driving

and encourage use of alternative modes. However, cars would continue to be allowed as a means for accessing and circulating within Park.

## Shuttle Service

Weekend shuttle service would provide an alternative way of accessing the Park on Saturdays and Sundays throughout the year. One route would connect the Golden Gate Bridge Toll Plaza to destinations in Marin Headlands with Fort Cronkhite as its terminus. Another route would link the Toll Plaza with Fort Baker and terminate at the Sausalito Ferry Terminal. Both services would have inbound and outbound service operating at 15 minute frequencies with service running continuously from 8 AM to 6 PM. Service would be expanded on the days that special events were being held in the Park. Fares should be free to maximize ridership and minimize the time needed for boarding and alighting. Ongoing operating costs could be subsidized through parking fees as described below.

Approximately eight shuttle vehicles would be acquired by the Park Service to operate the service. The shuttles would accommodate a minimum of 20 passengers, comply with ADA regulations, and feature storage space for recreational equipment, luggage, and bicycles. The vehicles would employ energy efficient clean fuel technology. The vehicles would be operated and maintained by a privately contracted transportation provider. The vehicles themselves could also be provided by a contractor as part of the shuttle program's pilot phase. However, the acquisition of an on-site fleet by the Park Service would enable the program's expansion with increased demand while reducing ongoing operating costs.

If NPS owned, the vehicle fleet would be stored on Park property. Potential shuttle storage locations include the Fort Cronkhite paved parking lot; the Park Service's maintenance yard near the Marine Mammal Center; the Golden Gate Transit turnout just east of the Barry-Baker Tunnel; within the vicinity of the future Fort Baker retreat and conference center; or off of Lower Conzelman Road beneath the northern terminus of the Golden Gate Bridge.

The Golden Gate Bridge Toll Plaza would serve as the primary point of transfer between the shuttles and transit services to Marin County and San Francisco. On weekends, the Toll Plaza is served by Golden Gate Transit Routes 10, 20, 50, 60, 70, 80; Muni lines 28, 29, and 76 (on Sundays only); and the Presidio Shuttle. Both Marin and San Francisco bound passengers returning from the Park would take the shuttles back to the Toll Plaza and connect with these same transit services.

Passengers with Marin County destinations could also connect with northbound Golden Gate Transit service from either the Sausalito ferry terminal or the Alexander Avenue bus stop at the US 101 North exit ramp. However, this bus stop is not easily accessed from either the Headlands or Fort Baker and is only served by Golden Gate Transit Routes 10, 20, and 50 which all run through Sausalito. In Approach 4: Maximum Auto-Reduction, a new transfer facility is proposed that would enable a direct connection within Marin County to all of the Golden Gate Transit routes running through US 101.

As shown in Figure 4-6, the Fort Cronkhite Shuttle would directly serve three major Visitation Areas including Battery Spencer, the Visitors Center, and Fort Cronkhite. The Capehart housing area, Headlands Center for the Arts, and the Hostel would be in close walking distance of a shuttle stop. Certain shuttle runs could also be modified to include extensions to Point Bonita and Hawk Hill, especially during the peak seasons for visiting these destinations. However, most of the service would generally adhere to the fixed route shown in Figure 4-6 in order to minimize travel times.

The Sausalito Shuttle would carry passengers to the Bay Area Discovery Museum, the future conference and retreat center, and downtown Sausalito. As shown in Figure 4-6, the route would continue from the Golden Gate Bridge to the Alexander Avenue off-ramp and proceed westward on Alexander to the Headlands entrance at Conzelman Road. The shuttle would continue through the Trailhead lot, follow Lower Conzelman Road to Fort Baker, and proceed to Sausalito via East Road and Bridgeway. Although this type of routing places the shuttles on a frequently congested segment of Alexander Avenue, passengers could use the Sausalito Shuttle to also reach the Headlands entrance and connect with the outbound Fort Cronkhite Shuttle.

The separation of the Fort Cronkhite and Sausalito routes allows the shuttles to provide more direct service at greater frequencies. Passengers will be able to transfer between the two shuttle services in Marin County as well as at the Golden Gate Bridge Toll Plaza. Passengers going from the Headlands to Fort Baker could take an inbound Fort Cronkhite Shuttle to the Headlands entrance on Conzelman Road and transfer to a Sausalito bound shuttle. Similarly, Fort Baker visitors could take an inbound Sausalito Shuttle and transfer to an outbound Fort Cronkhite Shuttle at the Headlands entrance on Conzelman Road.

The Fort Baker EIS requires that the chosen retreat and conference developer provide a shuttle service. There is also the SALLY shuttle service that operated between Fort Baker and downtown Sausalito during the summer of 2001. The Comprehensive Transportation Management Study for Route 1 may result in the provision of shuttle service to Muir Woods from a shuttle staging area at the Manzanita park-and-ride at Tam Junction. Implementation of Approach 3's shuttle program would need to integrate or appropriately link all these services into a unified service plan.

## Transit Improvement

A Golden Gate Transit bus pad would be placed along the westbound edge of Alexander Avenue near the Headlands entrance on Conzelman Road. The addition of a bus stop here would enable passengers on southbound Golden Gate Transit Routes 2, 10, 20, and 50 to directly access the Headlands entrance at Conzelman Road and connect with either the Fort Cronkhite or the Sausalito Shuttles.

## Parking Management

The elimination of certain parking areas in the Headlands would enable the designation of car-free areas. Parking would be removed from Conzelman Road west of Hawk Hill including the spaces at the Black Sands Beach Trailhead, Battery Rathbone-McIndoe, and Battery Wallace. (Note that Approach 1 proposes the closure of Conzelman Road west of Hawk Hill to private vehicles, making this part of the Park also car-free.) Parking would also be eliminated from Point Bonita, Bird Rock, the Rifle Range, and along Mitchell Road. The removal of parking would enable ecologic restoration in native habitat areas. The precise type, amount and cost of ecologic restoration would require additional study of affected landscape. In the short-term, however, removal of parking areas would require only the appropriate placement of parking restriction signage.

The Fort Baker Plan calls for the elimination of parking around the Parade Ground but permits parking in other areas north of the Parade Ground structures, in existing garages, in lots adjacent to Building 405 and on a former road behind Buildings 602-636. Approach 3 would go further by eliminating all of this parking as well, maintaining only East Road and the lots north and south of the BADM as charged parking areas. Special access to the waterfront be provided for the purposes of launching watercrafts, hauling equipment, and other special needs on a limited basis. The effort to make almost all of Fort Baker car-free will be highly dependent on the final site plan approved for the future conference and retreat center. The plan does provide for two waterfront parking lots with approximately 60 spaces in each.

The Park Service would charge and enforce parking fees during the day on weekends in the Headlands and Fort Baker. Parking would remain free on weekdays when shuttle service would not be provided. These fees would function as a disincentive to driving to and within the Park as well as revenue source for the ongoing operating costs of the shuttle program. In both the Headlands and Fort Baker, charged parking would be available at 15 designated lots:

- Trailhead Lot
- Battery Spencer
- Hawk Hill
- Bicentennial Lot
- YMCA
- Battery Alexander
- Visitors Center Lot
- Headland Center for the Arts
- Hostel
- Rodeo Beach

- Fort Cronkhite Western Offices
- Headlands Institute
- Marine Mammal Center
- Bay Area Discovery Museum
- East Road

Overnight charged parking adjacent to the waterfront would also be available to aquatic recreationalists at Horseshoe Bay. The informal off-road parking spaces on Conzelman Road between Battery Spencer and Hawk Hill would continue to be available free of charge. Given the number of individuals who momentarily pull to the side of Conzelman Road for a quick view of the Golden Gate Bridge, it would not be feasible to restrict or charge for parking here.

Each lot would be equipped with an hourly parking permit dispenser, pay-by space machine or other technology. Visitors would place the time and date marked permits inside their vehicles so that they were visible through the windshield. Employees working in the Park could purchase a monthly parking permit but the aggregate price would not be discounted from the hourly rate. Fees would also not be discounted for extended visits within the same day. A reasonable hourly fee would be about $1.00/hour with an $8.00 daily maximum. However, fees could be even higher during special events, peak visitation periods, or weekends when the vehicular impacts are higher on the Park's environment. Administration of the parking fee program could be handled by the Transportation Demand Management Coordinator recommended to be hired under implementation of the Marin Headlands and Fort Baker Transportation Demand Management Plan. However, at least two additional employees would be required to maintain the machines and enforce payment.

More parking areas could be eliminated from the Park if a structured parking garage could be built within close proximity of the Park entrances. The garage would need to accommodate approximately 350 vehicles to enable a significant reduction in the number of vehicles inside the Park. Potential sites include the area of Lower Conzelman Road beneath the northern terminus of the Golden Gate Bridge, the low lying area just outside the Barry-Baker tunnel and north of Danes Drive, or the area just east of the Rodeo Avenue southbound off-ramp from US 101. The construction of a parking facility would also require modification to the proposed shuttle routes so that they would directly serve the structure.

## Bike and Pedestrian Improvements

The elimination of the parking spaces along Mitchell Road in Fort Cronkhite would enable the establishment of a pedestrian trail alongside native plant restoration. The trail would help minimize pedestrian/vehicular conflicts on Mitchell Road.

# Approach 4: Maximum Auto-Reduction

The Maximum Auto-Reduction Approach would create a car-free experience in the Headlands and Fort Baker. Almost no private vehicles would be permitted anywhere in the Park. Virtually all trips to and within the Park would occur by transit, shuttles, bicycles, or walking. Local and regional accessibility to the Park would be significantly enhanced through a new transit transfer facility on US 101, expanded Golden Gate Transit and Muni service, and high frequency shuttle services. Almost all parking areas would be eliminated, enabling extensive ecologic restoration. Vehicular access and circulation would be permitted only for service providers, special deliveries, and emergency vehicles.

Although all of the Transportation Management Study approaches can be implemented in part or to varying degrees, more limited versions of Approach 4 could especially be applied. The car-free concept could be implemented only on weekends, during special events, peak visitation periods, or only in one part of the Park. However, for the purpose of describing the concept's fullest benefits, the approach is described below as an everyday, year-round, and Park-wide approach.

## Vehicular Circulation

The Conzelman Road entrance to the Headlands would be closed with removable bollards. A primary access gate would be installed just east of the Barry-Baker Tunnel on Danes Drive. A secondary gate would be installed on East Road near the Bay Area Discovery Museum. Under the year-round approach, the gates would be permanent structures. However, a more temporary form of access control could be provided under a more limited application of the maximum auto-reduction concept.

The Danes Drive gate would regulate entry into both the Headlands and Fort Baker. No human labor would be required to operate the gate. Access would be controlled through a key card, keypad code, or transponder system. Card or code authorization would be given to selected Park Service and Park Partner employees and volunteers based upon their need to bring a car on site. Ongoing access would be granted to Capehart housing residents, transit vehicles, and emergency vehicles. One-day codes could be provided for special program visitors such as school buses carrying children to the Headlands Institute. Drivers of delivery vehicles could be able to dial the phone number or code of their destination and be buzzed into the Park.

A similar system would be at work on East Road for special visitors or deliveries to Fort Baker's new conference and retreat center or the Bay Area Discovery Museum. Short-term codes would be provided to waterfront recreationalists only so that special equipment and gear could be dropped off at Horseshoe Bay. However, unlike Approach 3, no parking would be available for any visitors beyond the access gate. Although charged parking would be available behind the Bay Area Discovery Museum and along East Road, Approach 4 assumes that the majority of visitors to Fort Baker will not arrive by automobile.

## Public Information Campaign

Similar to the transportation information campaign proposed in Approach 1, printed brochures and Web pages would provide visitors with clear information about the Park's automobile and parking policies, transit connections, and shuttle services. Of course, any implemented approach to solving the Park's transportation program would some public information program. However, since the Park would be completely car-free, the campaign would need to be at a much greater scale and encompass a wider distribution. Consequently, a large scale information campaign must be included as a key component of Approach 4.

Information materials should be readily available at other Park visitor centers, hotels in San Francisco and Marin County, and at tourist information centers throughout the Bay Area. A coordinated effort should be made to disseminate updated information to the publishers of travel guides and other periodicals about recreation in the Bay Area. All Park Partners and event organizers should be required to include public information in their literature and on their Websites.

## Shuttle Service

Like Approach 3, the Maximum Auto-Reduction approach offers shuttle services as a way of traveling to the Headlands and Fort Baker. Service would be provided to both Fort Cronkhite and Sausalito with a stop in Fort Baker. However, Approach 4's shuttle network would operate seven days a week throughout the year instead of just on weekends. On weekdays, frequencies for inbound and outbound service would be 15 minutes; on weekends, frequencies would be ten minutes. This increased amount of service would require a shuttle fleet of 12 vehicles, each carrying a minimum of 30 passengers. A shuttle storage facility similar to the one described in Approach 3 would also need to be provided, assuming that the vehicles are owned by the Park Service.

The Fort Cronkhite and Sausalito Shuttle routes for Approach 4 will closely resemble those described for Approach 3. However, it will be more critical for the Fort Cronkhite Shuttle to have extensions to Hawk Hill and Point Bonita since there will be no vehicular access. Another difference is that Approach 4's shuttle network will be incorporated into a new bus transfer facility on US 101 (see **Transit Improvements** below.) Depending on the selected site for this facility, the shuttle routes would be modified to provide continuous direct service between Fort Cronkhite, Sausalito, and the bus transfer facility.

Besides the Fort Cronkhite and Sausalito Shuttles, a park-and-ride shuttle service from Marin County and San Francisco would be available on weekends during the Park's peak visitation season (March to October). Providing continuous service from 8 AM to 6 PM, the shuttles would operate at 30-minute frequencies from a commuter parking lot on either side of the Golden Gate Bridge. Potential lots in Marin County include the Manzanita

Park-and-Ride lot at Tam Junction and the Larkspur Ferry Terminal. In San Francisco, possible park and ride locations include the UCSF garage, commuter-oriented lots in South of Market, and the PacBell Stadium lots. The viability of these sites as park-and-ride locations will be contingent on their available capacity at the time of the shuttle program's implementation. Many of these locations are along or relatively near existing Golden Gate Transit routes. It may be possible to extend certain Golden Gate Transit routes to better serve park-and-ride lots on weekends.

## Transit Improvements

The Maximum Auto-Reduction approach involves three key critical elements for improving transit access to the Park. Firstly, the Golden Gate Transit bus service currently operating through US 101 would be captured as a means for accessing the Headlands and Fort Baker. Secondly, the capacity of existing local and regional transit services would be expanded to meet the demand of the Park's existing visitation levels which can be as high as 15,000 on a summer weekend day.[1] Thirdly, the proposed ferry service to Fort Baker would be linked with other transit services to the Park.

Approach 3 describes the simplest way of capturing Golden Gate Transit's bus service on US 101 by providing connecting shuttles from the Golden Gate Bridge Toll Plaza to the Headlands and Fort Baker. However, a new bus transfer facility on the Marin side of the Golden Gate Bridge would enable a more direct linkage between transit services, Park entrances, and connecting shuttle services. Such a facility would be especially advantageous for Marin County passengers who would not need to cross the bridge in order to access Park shuttles or board northbound Golden Gate Transit buses on US 101. There are several potential places where this type of facility should be explored:

- US 101 at the Alexander Avenue off-ramps would be a desirable location for a transit and shuttle stop because of the many Golden Gate Transit routes that currently run on US 101. Northbound Golden Gate Transit buses could stop either somewhere along the edge of the highway, either in Vista Point or in the gore between Alexander Avenue's on and off-ramps. However, both these options are compromised by operational challenges. High vehicular volumes in Vista Point would delay travel times for the Golden Gate Transit buses. The gore in the northbound off-ramp may not provide buses with sufficient distance to accelerate up to freeway speed given the ascending grade of US 101. A bus stop on the southbound side of US 101 is less problematic. Just before the bridge, buses would take the Alexander Avenue exit, load passengers along the edge of westbound Alexander Avenue, and then merge back on to the Golden Gate Bridge.

[1] Nelson\Nygaard Existing Conditions Report.

- Alexander Avenue could be redesigned with a roundabout at its intersection with the US 101 northbound off- and on-ramps. Northbound buses could take the Alexander Avenue exit, load passengers along the outer edge of the roundabout, and then re-enter the freeway with the existing on-ramp. Southbound buses could either utilize the roundabout or the edge of westbound Alexander Avenue as described above.
- Rodeo Avenue's intersection with US 101 could be redesigned to include Golden Gate Transit bus pads. The construction of a roadway tunnel underneath US 101 at Rodeo would allow shuttles to load Golden Gate Transit passengers from both sides of US 101 and then continue back southbound on US 101 to the Park. As suggested for the area around the Alexander Avenue off ramps, a similar type of bus loading could occur directly on southbound and northbound US 101. The absence of competing circulation issues (such as the bridge approach or the entry to Vista Point) would provide more flexibility in redesigning the road geometry to accommodate buses merging off and into US 101. Shuttle services could be extended to serve the interchange. A park and ride facility may also be possible just west of the southbound ramps.
- The Spencer Avenue intersection with US 101 may be a more viable location than Rodeo Avenue for a bus transfer facility. Since it already enables through movements beneath 101 and supports Golden Gate Transit Bus Pads on both sides of 101. However, there may not be the same land available for a park-and-ride facility as at Rodeo Avenue.
- The Park Service is currently exploring the use of the Manzanita park and ride lot as a staging area for shuttle services to Marin Woods. The potential for using this area as a transfer center, shuttle turnaround or park-and-ride should also be explored for the Headlands and Fort Baker.

All of these options pose complex operational and design issues including travel time impacts on Golden Gate Transit, the interface between the bus stops with each other as well as with connecting shuttle services, and the pedestrian accessibility to the transit stops and across the highway. Besides the initial capital expenses, this type of project would also require a funding approach for ongoing operational costs. A coordinated feasibility study would be required before any concrete recommendations could be made for the location of a bus and shuttle facility in a place other than the Golden Gate Bridge Toll Plaza.

Similarly, the Park Service would need to study Golden Gate Transit's existing transit capacity and assess the transit demand impacts of closing the Park to vehicles. This type of analysis should also be performed for Golden Gate Transit ferry service, Muni, and the SALLY. Effort should also be made to increase the frequency of Muni's 76 service to ten minutes and expand service to Saturdays. (See Appendix C for a preliminary analysis of the amount of additional Golden Gate Transit and Muni service that would be required to

eliminate vehicular access to the Park.) However, it should be noted that not all visitors would need public transit. Some riders would arrive by the Park and Ride shuttles.

The Park Service and the Water Transit Authority have identified Horseshoe Bay in Fort Baker as a potential recreational ferry stop. Along with the high frequency shuttles and expanded Golden Gate Transit Service, the addition of ferry service would increase the viability of the Maximum Auto-Reduction Alternative. Ferry service would provide another auto-free alternative for accessing the Park from San Francisco and Marin County.

Ferry service would also create an opportunity for creating an intermodal transit hub on Lower Conzelman Road in Fort Baker. At Horseshoe Bay, ferry passengers could easily transfer to a Sausalito Shuttle or to a connecting shuttle service to the Headlands. Consideration should be given to rerouting at least some of the Sausalito bound Golden Gate Transit service from Alexander Avenue to Lower Conzelman Road. This would enable ferry and shuttle passengers the ability to transfer to Golden Gate Transit routes such as the 2, 10, 20, or 50. This type of rerouting would require a coordinated study between the National Park Service, the Water Transit Authority, and the Golden Gate Bridge and Highway District to assess the viability of a fully intermodal hub and the impacts on Golden Gate Transit's bus ridership and travel times.

## Parking Management

Parking would be entirely eliminated from the Headlands and Fort Baker for all employees and visitors. Only service and emergency vehicles, on-site residents, disabled individuals, and Park Service/Park Partner employees demonstrating a job-related need for a car could park in the Headlands or Fort Baker. Capehart residents would be permitted to park only at the spaces near their homes but not at other locations in the Park. Aquatic recreationalists would be able to drop-off equipment at the waterfront but would need to park outside of the car-free zone. Elimination of parking areas would enable extensive ecologic restoration.

Charged parking would be available to all visitors (including aquatic recreationalists) along East Road and behind the Bay Area Discovery Museum. Parking would be priced to limit demand, with the assumption being that most visitors and all employees to the BADM and other Fort Baker uses would arrive not arrive by automobile. If Fort Baker's access needs can be effectively met with shuttles or ferries, it may be possible to implement the Fort Baker EIS optional mitigation measure of closing East Road at the Alexander Avenue intersection. However, staff access to the sewage treatment plant would still be provided.